MILITARY SPECIFICATION

SWITCHES, RADIO FREQUENCY TRANSMISSION LINE (COAXIAL), GENERAL SPECIFICATION FOR

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the general requirements for coaxial switches, either manually or remotely controlled, for use with coaxial cable at radio frequencies.

1.2 Classification. Coaxial switches shall be of the following classes (see 6.2):

Class	Type of RF connector
1	N
2	1-5/8 inch
3	7/8 inch
4	TNC
5	SMA and 3.5 mm
6	SMC
7	BNC
8	SC
9	C
10	LC
11	LT
12	6-1/8 inch
13	HN
14	7 mm

1.2.1 Military part number. The military part number shall consist of the letter "M" followed by the basic number of the specification sheet, an assigned dash number (see 3.1), and the letter N or S; where N indicates a nonscreened item and S indicates a screened item. Part numbers without N or S shall be considered nonscreened items.

M3928/15- 01 N or S

- Military designator and specification sheet number
- Dash number designated on specification sheet
- Nonscreened
- Screened

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Defense Electronics Supply Center ATTN: DESC-ES Dayton, OH 45444-5276 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

2. APPLICABLE DOCUMENTS

2.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

QQ-A-200	-	Aluminum Alloy, Bar, Rod, Shapes, Structural, Shapes, Tube and Wire, Extruded: General Specification For.
QQ-A-225	-	Aluminum and Aluminum Alloy Bar, Rod, Wire, or Special Shapes, Rolled, Drawn, or Cold Finished, General Specification For.
QQ-A-250	-	Aluminum and Aluminum Alloy Plate and Sheet: General Specification For.
QQ-A-591	-	Aluminum Alloy Die Castings.
QQ-A-596	-	Aluminum Alloy Permanent and Semi-Permanent Mold Castings.
QQ-A-601	-	Aluminum-Alloy Sand Castings.
QQ-B-613	-	Brass, Leaded and Non-Leaded, Flat Products (Plate, Bar, Sheet, Strip).
QQ-B-626	-	Brass, Leaded and Non-Leaded: Rod, Shapes, Forgings, and Flat Products with Finished Edges (Bar and Strip).
QQ-C-530	-	Copper-Beryllium Alloy Bar, Rod, and Wire (Copper Alloy Numbers 172 and 173).
QQ-C-533	-	Copper-Beryllium Alloy Strip (Copper Alloy Numbers 170 and 172).
QQ-S-365	-	Silver Plating, Electrodeposited; General Requirements For.
QQ-S-763	-	Steel Bars, Wire, Shapes and Forgings, Corrosion-Resisting.

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MIL-P-1144	-	Pipe, Stainless Steel (Corrosion-Resistance), Seamless or Welded.
MIL-C-3643	-	Connectors, Coaxial, Radio Frequency, Series HN and Associated Fittings, General Specification For.
MIL-C-3650	-	Connectors, Coaxial, Radio Frequency, Series LC.
MIL-S-4043	-	Steel, Corrosion-Resisting (Extra Low Carbon Type 304) Plate, Sheet, and Strip Case.
MIL-S-5002	-	Surface Treatments and Inorganic Coating for Metal Surfaces of Weapon Systems.
MIL-C-5015	-	Connector, Electrical, Circular Threaded, HN Type, General Specification For.
MIL-C-5541	-	Chemical Conversion Coatings on Aluminum Alloys.
MIL-S-7720	-	Steel, Corrosion Resistant (18-8) Bars, Wire and Forging Stock (Aircraft Quality).
MIL-A-8625	-	Anodic Coatings, for Aluminum and Aluminum Alloys.
MIL-T-10727	-	Tin Plating, Electrodeposited or Hot-Dipped, For Ferrous and Nonferrous Metals.
MIL-F-14072	-	Finishes for Ground Signal Equipment.
MIL-F-24044	-	Flanges, Coaxial Line, Rigid Air Dielectric, General Specification For.
MIL-C-26074	-	Coating, Electroless Nickel, Requirements For.
MIL-C-26482	-	Connector, Electrical, (Circular, Miniature, Quick Disconnect, Environmental Resisting) Receptacle and Plug, General Specification For.
MIL-C-26637	-	Connectors, Coaxial, Radio Frequency, Series LT, General Specification For.
MIL-S-28786	-	Switches, Packaging of.
MIL-C-38999	-	Connector, Electrical, Circular, Miniature, High Density, Quick Disconnect (Bayonet, Thread, and Breech Coupling) Environmental Resistant, Removable Crimp and Hermetic Solder Contacts, General Specification For.
MIL-C-39012	-	Connectors, Coaxial, Radio Frequency, General Specification For.

MIL-G-45204	-	Gold Plating, Electrodeposited.
MIL-T-55155	-	Terminals, Feedthru (Insulated) and Terminals, Stud (Insulated and Noninsulated).
MIL-C-81511	-	Connector, Electrical, Circular, High Density, Quick Disconnect, Environment Resisting and Accessories, General Specification For.
MIL-C-83723	-	Connector, Electrical, (Circular, Environment Resisting), Receptacles and Plugs, General Specification For.

STANDARDS

FEDERAL

FED-STD-H28	-	Screw-Thread Standards for Federal Services.

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MIL-STD-202	-	Test Methods for Electronic and Electrical Component Parts.
MIL-STD-454	-	Standard General Requirement for Electronic Equipment.
MIL-STD-889	-	Dissimilar Metals.
MIL-STD-1285	-	Marking of Electrical and Electronic Parts.
MIL-STD-1562	-	Lists of Standard Microcircuits.
MS91528	-	Knobs-Control, Plastic (Round, Concentric, Pointer, Spinner, Spinner Slip Clutch, Bar, Tactile, Knob-Lock Pointer, and Knob Locks).

(Copies of the specifications and standards required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS shall be the issue of the non-Government documents which is current on the date of the solicitation.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE-STD-287	-	Precision Coaxial Connectors.

(Application for copies should be addressed to the Institute of Electrical and Electronics Engineers Headquarters, 345 East 47 Street, New York, NY 10017.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

*ASTM-A484/A484M	-	Bars, Billets and Forgings, Stainless and Heat-Resisting, General Specification For.
*ASTM-A582	-	Free-Machining Stainless and Heat-Resisting Steel Bars, Hot-Rolled or Cold-Finished.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Non-Government standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for specification sheets), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

* DOD adopted.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between requirements of this specification and the specification sheet, the latter shall govern.

3.2 Qualification. Switches furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (see 4.5 and 6.3).

3.3 Material. The material shall be as specified herein and in the applicable specification sheets. When a definite material is not specified, a material shall be used which will enable the switch to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.3.1 Brass. Brass shall conform to QQ-B-626 or QQ-B-613.

3.3.2 Copper alloy. Copper alloy sheets shall conform to QQ-B-613.

3.3.3 Copper-beryllium. Beryllium copper shall conform to QQ-C-530 or QQ-C-533, half-hard temper.

3.3.4 Corrosion-resisting steel. Corrosion-resisting steel plates, sheets, and strips shall conform to MIL-S-4043. Corrosion-resisting forgings shall conform to QQ-S-763, MIL-S-7720, ASTM A484/A484M or A582 and corrosion-resisting steel pipes shall conform to MIL-P-1144.

3.3.5 Aluminum alloy. Aluminum alloy plates and sheets shall conform to composition 6061 of QQ-A-250/11 or composition 1100 of QQ-A-250/1, extruded aluminum alloys shall conform to 6063 of QQ-A-200/9 or composition 6061 of QQ-A-250/11. Aluminum alloy castings shall conform to alloy A360 of QQ-A-591, class 8 of QQ-A-596, alloy 40E of QQ-A-601, or 2011 of QQ-A-225/3.

3.3.6 Finishes. Unless otherwise specified, the finishes shall be as specified in 3.3.6.1 through 3.3.6.3.

3.3.6.1 RF and power mating surfaces. Mating surfaces shall be finished in gold, nickel, silver, tin, or passivate conforming to MIL-G-45204, type 1, grade C, class 1, MIL-C-26074, QQ-S-365, MIL-T-10727, or MIL-S-5002. The minimum thickness for gold and nickel plating shall be 10 microinches and 20 microinches, respectively. Passivated steel surfaces shall be anodized in accordance with MIL-A-8625.

3.3.6.2 External surfaces. All external surfaces except RF and power mating surfaces shall be painted with a semigloss of dull black enamel finish in accordance with type II of MIL-F-14072.

3.3.6.3 Aluminum alloys. Aluminum alloy surfaces shall be nickel-plated, gold-plated, or chemically treated in accordance with MIL-C-5541, class 3. When surfaces are chemically tested, the RF and power mating surfaces shall be conductive.

3.3.7 Dissimilar metal. Unless suitably protected against electrolytic corrosion, dissimilar metal as defined in MIL-STD-889 shall not be in intimate contact.

3.3.8 Fungus. Material used in the construction of coaxial switches shall be fungus inert in accordance with requirement 4 of MIL-STD-454.

3.4 Design and construction. Coaxial switches shall be of the design, construction, and physical dimensions specified (see 3.1).

3.4.1 Operation. Switches shall be either electrically or manually operated and identified (see 3.1) as follows:

a. Manually controlled - M
b. Remotely controlled (RC) - R
   (1) Solenoid - S
      a. Fail-safe - F
      b. Latching - L
   (2) Motor - M
c. Logic - Lo

3.4.2 Configuration. Switches shall be furnished with the number of positions specified (see 3.1).

3.4.3 Sequence. Switches shall have a break-before-make sequence of operation, unless otherwise specified (see 6.2).

3.4.4 Termination. Switches shall be supplied with their off-circuit output terminals open (o), grounded (g), or terminated in a resistor (r) as specified (see 3.1). Unless otherwise specified (see 6.2), terminal resistors shall be a nominal 50-ohm, 1/2-watt resistor.

3.4.5 Nominal impedance. Nominal impedance shall be as specified (see 3.1).

3.4.6 Duty. Switches shall be capable of intermittent switching actions only, unless continuous duty is specified (see 6.2).

3.4.7 Threaded parts. All external threaded parts shall have screw threads in the unified screw thread series in accordance with *FED-STD-H28 and supplements thereto.* Tapped holes in aluminum housings specifically provided for mounting of the switching shall be provided with inserts to assure adequate thread strength and life.

3.4.8 Connectors. All connectors shall have their metallic shells grounded to the switch metallic casing.

3.4.8.1 Radio frequency (RF) connectors. Connectors for a specific switch shall be as specified (see 3.1). All RF connectors shall meet mating and material requirements of the following applicable specifications.

Type of RF connector	Specification
N	MIL-C-39012
1-5/8 inch	MIL-F-24044
7/8 inch	MIL-F-24044
TNC	MIL-C-39012
SMA and 3.5 mm	MIL-C-39012
SMC	MIL-C-39012
BNC	MIL-C-39012
SC	MIL-C-39012
C	MIL-C-39012
LC	MIL-C-3650
LT	MIL-C-26637
6-1/8 inch	MIL-F-24044
HN	MIL-C-3643
7 mm	IEEE-STD-287

3.4.8.1.1 RF connector metal parts. Unless otherwise specified, the male center contact pins shall be captivated and made of corrosion-resisting steel or beryllium copper. Corrosion-resisting steel pins shall be type 302 or type 304 in accordance with QQ-S-763, or type 303 in accordance with ASTM A582. Beryllium copper pins shall conform to QQ-C-530 and shall be silver-plated in accordance with QQ-S-365 or gold-plated in accordance with MIL-G-45204, type II (as a minimum), class 1. The female center contact pins shall be captivated and made of beryllium copper conforming to QQ-C-530 and silver-plated in accordance with QQ-S-365 or gold-plated in accordance with MIL-G-45204, type II (as a minimum), class 1.

3.4.8.2 Power connectors. Unless otherwise specified, the power connectors shall conform to MIL-C-5015, MIL-C-26482, MIL-C-38999, MIL-C-81511, or MIL-C-83723.

3.4.8.3 Connector caps. All connectors shall be capped with push-on plastic caps to prevent both damage and the entrance of moisture and foreign material during shipment or storage.

3.4.9 Solder terminals. Solder terminals shall be in accordance with MIL-T-55155.

3.4.10 Control knobs. Control knobs shall be in accordance with MS91528.

3.4.11 Diode suppression. When a diode is used for radio frequency (RF) noise suppression, it shall be protected by another diode such that applying a reverse polarity to the actuating circuit does not cause an excessive current to flow in the suppressing diode. Unless otherwise specified, all suppressing diodes shall be mounted inside the switch body.

3.4.12 Indicating circuits. When specified (see 6.2), remotely-controlled switches shall be equipped with separate contacts and terminals to operate a pilot light or other device which shall indicate the completed circuit in a single position switch or each position of a multiple position switch.

3.4.13 Housing. Switches shall be as identified below and as specified (see 3.1):

a. Enclosed type (to exclude sand and dust) - (E).

b. Hermetically sealed type - (H).

c. Immersion-proof type - (I).

d. Open type - (O).

3.4.14 Operating frequency range. The frequency range shall be as specified (see 3.1).

3.4.15 Temperature range. The temperature range shall be as specified (see 3.1).

3.4.16 Weight. The weight shall not exceed the limit specified (see 3.1).

3.4.17 Internal semiconductor devices. Semiconductor devices used within the switches shall conform to requirement 30 of MIL-STD-454. A minimum of JANTX level parts shall be used for screened switches.

3.4.18 Internal microelectronic devices. Microelectronic devices used within the switches shall conform to requirement 64 of MIL-STD-454. A minimum of microcircuits listed in table II of MIL-STD-1562 shall be used for screened switches.

3.5 Performance.

3.5.1 Screening. All screened switches produced to this specification shall be screened in accordance with table III.

3.5.2 Run-in. All switches produced to this specification shall be run-in in accordance with 4.7.3.

3.5.3 Voltage standing wave ratio (VSWR). When switches are tested as specified in 4.7.4, the VSWR at any port over the specified frequency range shall not exceed the value specified (see 3.1).

3.5.4 Insertion loss. When switches are tested as specified in 4.7.5, the insertion loss between ports of any continuous path over the specified frequency range shall not exceed the value specified (see 3.1).

3.5.5 Isolation. When switches are tested as specified in 4.7.6, the isolation between connected ports and the open ports over the specified frequency range shall be not less than specified (see 3.1).

3.5.6 RF power handling capability. When switches are tested as specified in 4.7.7, with rated power (see 3.1) passing through the switch, no evidence of breakdown, charring, or arcing shall be evident. Following this test, insertion loss shall be no greater and isolation no less than the values specified (see 3.5.4 and 3.5.5 respectively). Unless otherwise specified (see 6.2), switches shall not be required to switch under power.

3.5.7 Switching time (including contact bounce). When remotely-controlled switches are tested as specified in 4.7.8, the time required for switching to the first adjacent position reached in the direction of switching shall not exceed the time specified (see 3.1), except electric motor operated switches shall be allowed a 25 percent increase in switching time at the lowest temperature specified (see 3.1).

3.5.8 Operating current and voltage. When remotely-controlled switches are tested as specified in 4.7.9, the following requirements shall be met:

a. Unless otherwise specified (see 3.1), when the applicable minimum operating voltage specified below is applied, the switch shall move into a selected position and make positive contact.

Minimum	Maximum
4.5 V dc	5.5 V dc
9 V dc	14 V dc
20 V dc	30 V dc
38 V dc	54 V dc
99 V dc	121 V dc
103 V dc	127 V dc

b. When the nominal operating voltage (see 3.1) is applied, the operating current shall not exceed that specified (see 3.1).

c. Remotely-controlled solenoid switches shall return to the deenergized position when the activating voltage is reduced to the value of drop-out voltage as specified (see 3.1).

3.5.9 Operating force (manually controlled). When tested as specified in 4.7.10, switches shall operate smoothly. Accurate selection of an adjacent position shall be accomplished within two seconds. The force or torque required to actuate the switch shall be measured with an appropriate measuring device.

3.6 Dielectric withstanding voltage. When switches are tested as specified in 4.7.11, the switches shall withstand without breakdown, the voltage specified in the applicable RF connector specification (see 3.4.8.1) applied for one minute between each pair of open RF connectors and between the center conductor and the shell of each RF connector. Each actuator and indicator terminal shall withstand the voltage (see 4.7.11) to the shell.

3.7 Insulation resistance. When switches are tested as specified in 4.7.12, the insulation resistance from case to any pin and between normally open pins shall be not less than that specified (see 3.1).

3.8 Transient interference (RFI). When specified, remotely-controlled switches shall be tested in accordance with 4.7.13 and shall not conduct RF noise to a degree greater than the following limiting values:

a. DC switches +50 percent or -150 percent of nominal line voltage (28 V dc limit is +42 V peak).

b. AC switches +2 times nominal rms line voltage (115 V ac limit is +230 V peak).

3.9 RF energy leakage. When switches are tested as specified in 4.7.14, the RF leakage from the switch shall be at least 65 dB below the incoming signal level.

3.10 Heat (fail-safe switches only). When tested as specified in 4.7.15, there shall be no sign of failure and the switching time shall be as specified (see 3.5.7). Any changes in the appearance of the switch or the switching time exceeding the value specified shall be considered a failure.

3.11 Solderability (as applicable). When switches with solderable connections are tested as specified in 4.7.16, they shall meet the acceptable criteria of method 208 of MIL-STD-202.

3.12 Resistance to soldering heat (as applicable). When switches with solderable connections are tested as specified in 4.7.17, there shall be no damage to the switches or to the terminal insulator that will cause electrical failure. Chipping of the terminal insulator shall not be cause for failure, unless the chipping extends to the outer periphery. After the test, the switching time of the switch shall not be greater than specified and the operating current to the switch shall not exceed the maximum specified value.

3.13 Resistance to solvents. When switches are tested as specified in 4.7.18, the marking shall be legible at a distance of at least six inches with normal room lighting, and there shall be no visual evidence of mechanical damage or deterioration of materials or finishes under 3X magnification.

3.14 Terminal strength (as applicable). When switches with solder or screw terminals are tested as specified in 4.7.19, there shall be no evidence of broken terminals, elongations greater than one-half the thread pitch, or breakage, loosening, or relative motion between the terminals and switch body when viewed through a magnification of at least 10X. Any of these shall be considered a failure.

3.15 Thermal shock. When switches are tested as specified in 4.7.20, the switch shall be capable of reliable operation. Following the test, the switch shall meet the specified insertion loss, isolation, and switching time requirements. Any value that exceeds the specified requirement shall be considered a failure.

3.16 Altitude and cold. When switches are tested as specified in 4.7.21, there shall be no evidence of malfunction. During the test, the switch shall operate within the switching time specified (see 3.1) and withstand the dielectric withstanding voltage without breakdown. Switches that do not meet these two requirements shall be considered failures.

3.17 Moisture resistance (applicable to types E and I only). When switches are tested as specified in 4.7.22, there shall be no evidence of breaking, cracking, spalling, or loosening of parts or insulation. Following the test, the switch shall meet the insertion loss, switching time, and dielectric withstanding voltage requirements. Switches that do not meet these requirements shall be considered failures.

3.18 Humidity (applicable to types E and O only). When switches are tested as specified in 4.7.23, there shall be no evidence of physical damage. Following the test, the switch shall meet the voltage standing wave ratio (VSWR) and the isolation requirements. Switches that do not meet these requirements shall be considered failures.

3.19 Sand and dust (applicable to type E only). When switches are tested as specified in 4.7.24, there shall be no marked evidence of sand and dust accumulation within the enclosure. Following the test, the switch shall meet the insertion loss and switching time requirements. Switches that do not meet these requirements shall be considered failures.

3.20 Immersion (applicable to type I only). When switches are tested as specified in 4.7.25, there shall be no leakage as evidenced by a continuous stream of bubbles. Following the test, the switch shall meet the insertion loss and switching time requirements. Switches that do not meet these requirements shall be considered failures.

3.21 Hermetic seal (applicable to type H only). When switches are tested as specified in 4.7.26, the leakage rate shall not exceed the applicable value specified below. The volume shall be computed using the external dimensions of the switch housing, disregarding any mounting (screws, stud, etc.).

Sealed volume case	Maximum allowable leakage
Greater than 2 cubic inches	10^{-6} atm cm^3/s
2 cubic inches or less	10^{-8} atm cm^3/s

3.22 Life cycle. When tested as specified in 4.7.27, the switch shall show no evidence of physical damage or deterioration. Following the test, the switch shall meet the insertion loss, switching time, VSWR and isolation requirements. Switches that do not meet these requirements shall be considered failures.

3.23 Explosion (applicable to types H and I only). When switches are tested as specified in 4.7.28, there shall be no explosion within the test chamber whether or not an explosion occurs within the switch. Following the test, the switch shall meet the insertion loss requirement. Switches that do not meet this requirement shall be considered failures.

3.24 Salt spray (corrosion) (applicable to types H and I only). When switches are tested as specified in 4.7.29, there shall be no evidence of warping, cracking, peeling or corrosion that has passed through the surface finish and exposed the base metal, or any lead breakage when viewed through a magnification of at least 10X. Following the test, the switch shall meet the switching time requirement. Switches that do not meet any of these requirements shall be considered failures.

3.25 Vibration. When switches are tested as specified in 4.7.30, there shall be no evidence of physical damage. Following the test, the switch shall meet the insertion loss and switching time requirements.

3.26 Acoustic noise (when specified, see 3.1) When switches are tested as specified in 4.7.31, there shall be no deterioration or change in tolerance limits of any internal or external parts. Following the test, the switch shall meet the VSWR and insertion loss requirements.

3.27 Shock (specified pulse). When switches are tested as specified in 4.7.32, there shall be no evidence of damage or loosening of parts. Following the test, the switch shall meet the insertion loss and switching time requirements.

3.28 Solar radiation (sunshine). When switches are tested as specified in 4.7.33, there shall be no evidence of jamming or loosening of moving parts, loss of seal integrity, premature actuation of electrical contacts, or blistering and peeling of paints and other finishes. During and after the test, the switch shall meet the isolation and switching time requirements.

3.29 Marking. Switches shall be marked in accordance with MIL-STD-1285, with the military part number, manufacturer's source code or logo, operating voltage and the frequency in the case of an ac supply for electromechanically operated switches, date code, and serialization. Terminals shall be marked in a logical manner to identify the input and output terminals. The marking characters shall be at least .0312 inch high. The marking shall remain legible after completing all environmental tests specified herein.

3.29.1 Date code. Switches shall be marked by a unique code to identify the period during which they were manufactured. The first two numbers in the code shall be two digits of the number of the year, and the third and fourth number shall be two digits indicating the calendar week of the year. When the number of the week is a single digit, it shall be proceeded by a zero reading from left to right or top to bottom, the code number shall designate the year and week, in that order. The date code shall not be altered or removed from the switch.

3.29.2 Serialization. Each switch shall be marked with a unique serial number assigned consecutively within the inspection lot allowing traceability of the switch.

3.30 Workmanship. Switches shall be manufactured and processed in a careful and workmanlike manner in accordance with good engineering and production practices. The switch shall be free from tool marks, deep scratches, corrosion, and other defects that will affect life, serviceability, or appearance.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspections set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to the acceptance of defective material.

4.2 Classification of inspections. The inspections specified herein are classified as follows:

a. Materials inspection (see 4.3).

b. Qualification inspection (see 4.5).

c. Quality conformance inspection (see 4.6).

4.3 Materials inspection. Materials inspection shall consist of certification supported by verifying data that the materials listed in table I, used in fabricating the switch, are in accordance with the applicable referenced specifications or requirements prior to such fabrication.

4.4 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202.

4.4.1 Test method variation. Variation from the specified test methods used to verify the electrical parameters are allowed provided that it is demonstrated to the preparing activity or their agent that such variations in no way relax the requirements of this specification and that they are approved before testing is performed. For proposed test variations, a test method comparative error analysis shall be made available for checking by the preparing activity or their agent.

4.5 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with equipment and procedures normally used in production. Qualification obtained for each group (see appendix) shall constitute qualification for all switches with characteristics for that group.

4.5.1 Sample size. Four samples of the same part number shall be subjected to qualification inspection.

4.5.2 Inspection routine. The sample shall be subjected to the qualification inspection specified in table II in the order shown. All units shall be subjected to the inspections of group I. The sample shall then be divided into two groups of two units each (see 4.5.1). The sample units shall then be subjected only to the inspection indicated for their particular group.

4.5.3 Failures. One or more failures shall be cause for refusal to grant qualification approval. A failure shall be anything that does not meet the requirements of the specification.

TABLE I. Materials inspection.

Material	Requirement paragraph	Applicable specification
Brass	3.3.1	QQ-B-613, QQ-B-626
Copper alloy	3.3.2	QQ-B-613
Copper beryllium	3.3.3	QQ-C-530, QQ-C-533
Corrosion-resisting steel	3.3.4	QQ-S-763, MIL-S-4043, MIL-P-1144, MIL-S-7720, ASTM A484,or A582
Aluminum alloy	3.3.5	QQ-A-225, QQ-A-200, AA-A-250, QQ-A-591, QQ-A-601, QQ-A-596
Finishes	3.3.6	MIL-C-45204, MIL-C-26074, MIL-T-10727, MIL-S-5002, MIL-A-8625, MIL-A-14072, MIL-C-5541, QQ-S-365
Dissimilar metal	3.3.7	MIL-STD-889
Fungus	3.3.8	MIL-STD-454
Threaded parts	3.4.7	FED-STD-H28
Connectors	3.4.8	MIL-C-39012, MIL-F-24044, MIL-C-3650, MIL-C-26637, MIL-C-3643, MIL-C-5015, MIL-C-26482, MIL-C-38999, MIL-C-81511, MIL-C-83723, IEEE-STD-287
Solder terminal	3.4.9	MIL-T-55155
Control knob	3.4.10	MS91528
Semiconductor devices	3.4.17	MIL-STD-454
Microelectronic devices	3.4.18	MIL-STD-454

TABLE II. Qualification inspection.

Inspection	Requirement paragraph	Test method paragraph
Group I (all samples)		
Screened per table III (for screened switches only)	3.5.1	4.7.2
Visual and mechanical inspection 1/	3.1,3.3,3.4,3.29, and 3.30	4.7.1
Run-in 1/	3.5.2	4.7.3
VSWR	3.5.3	4.7.4
Insertion loss	3.5.4	4.7.5
Isolation	3.5.5	4.7.6
Switching time	3.5.7	4.7.8
Operating current and voltage	3.5.8	4.7.9
Operating force (manually controlled)	3.5.9	4.7.10
Group II (2 samples)		
RF power handling capability	3.5.6	4.7.7
Dielectric withstanding voltage	3.6	4.7.11
Transient interference 2/	3.8	4.7.13
RF energy leakage	3.9	4.7.14
Heat (fail-safe switches only)	3.10	4.7.15
Switching time	3.5.7	4.7.8
Solderability 3/	3.11	4.7.16
Resistance to soldering heat 3/	3.12	4.7.17
Switching time	3.5.7	4.7.8
Operating current	3.5.8	4.7.9

See footnotes at end of table.

TABLE II. Qualification inspection - Continued.

Inspection	Requirement paragraph	Test method paragraph
Group II (2 samples) - Continued		
Resistance to solvents	3.13	4.7.18
Terminal strength 4/	3.14	4.7.19
Thermal shock	3.15	4.7.20
Insertion loss	3.5.4	4.7.5
Isolation	3.5.5	4.7.6
Switching time	3.5.7	4.7.8
Altitude and cold	3.16	4.7.21
Switching time	3.5.7	4.7.8
Dielectric withstanding voltage	3.6	4.7.11
Moisture resistance 5/	3.17	4.7.22
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Dielectric withstanding voltage	3.6	4.7.11
Humidity 6/	3.18	4.7.23
VSWR	3.5.3	4.7.4
Isolation	3.5.5	4.7.6
Visual and mechanical inspection 1/	3.1,3.3,3.4,3.29, and 3.30	4.7.1
Group III (2 samples)		
Insulation resistance	3.7	4.7.12
Sand and dust 7/	3.19	4.7.24
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Immersion 8/	3.20	4.7.25
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Hermetic seal 9/	3.21	4.7.26
Life cycle	3.22	4.7.27
VSWR	3.5.3	4.7.4
Insertion loss	3.5.4	4.7.5
Isolation	3.5.5	4.7.6
Switching time	3.5.7	4.7.8
Explosion 10/	3.23	4.7.28
Insertion loss	3.5.4	4.7.5
Salt spray 10/	3.24	4.7.29
Switching time	3.5.7	4.7.8
Vibration	3.25	4.7.30
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Acoustic noise 2/	3.26	4.7.31
VSWR	3.5.3	4.7.4
Insertion loss	3.5.4	4.7.5
Shock	3.27	4.7.32
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Solar radiation	3.28	4.7.33
Isolation	3.5.5	4.7.6
Switching time	3.5.7	4.7.8
Visual and mechanical inspection	3.1,3.3,3.4,3.29, and 3.30	4.7.1

1/ Nonscreened switches only.
2/ When specified.
3/ Switches with solderable leads or terminals.
4/ Switches with leads or terminals.
5/ Applicable to types E and I only.
6/ Applicable to types E and O only.
7/ Applicable to type E only.
8/ Applicable to type I only.
9/ Applicable to type H only.
10/ Applicable to types H and I only.

4.5.4 Disposition of qualification sample units. Sample units which have been subjected to qualification testing shall not be delivered on any contract or purchase order. The Government reserves the right to retain the sample units or to require the contractor to furnish the sample units with the qualification inspection report.

4.5.5 Retention of qualification. To retain qualification, the contractor shall forward reports at 24-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of:

a. A summary of the results of the tests performed for inspection of product for delivery (group A), indicating, as a minimum, the number of switches that have passed and the number that have failed. The results of the tests of all reworked switches shall be identified and accounted for.

b. A summary of the results of tests performed for periodic (group B) inspection, including the number and mode of failures. The summary shall include results of all periodic inspection tests performed and completed during the 24-month period. If the summary of test results indicate nonconformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

Failure to submit the report within 60 days after the end of each 24-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 24-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the switches. If during the two consecutive reporting periods there has been no production, the manufacturers may be required, at the discretion of the qualifying activity, to submit their qualified products to testing in accordance with the qualification inspection requirements and the reason for no production.

4.6 Quality conformance inspection.

4.6.1 General. Quality conformance inspection shall consist of group A inspection, screening (when applicable), and group B inspection. Group B inspection shall be performed under periodic inspection.

4.6.1.1 Inspection lot. An inspection lot shall consist of all switches with the same part number produced under essentially the same conditions, and offered for inspection at one time.

4.6.1.2 Screening. Screening shall consist of the inspection and tests specified in table III in the order shown. Switches shall pass screening before being subjected to group A inspection.

4.6.1.3 Group A inspection. Group A inspection shall consist of the inspection and tests specified in table IV, in the order shown.

4.6.1.4 Hundred-percent inspection. All screened switches shall be subjected to screening and group A inspection. All nonscreened switches shall be subjected to group A inspection. Defective units shall be individually rejected.

4.6.1.5 Rejected items. If an inspection item is rejected, the contractor may rework it to correct the defect and resubmit for reinspection. Such items shall be separate from new items and shall be clearly identified as reinspected items.

4.6.1.6 Test data. Data shall be taken and recorded for all tests performed on individual items and sent to the acquiring agency. The manner of performing measurements and data sheets shall be included and shipped in the same container as the switch. No classified information shall appear on the data sheet.

TABLE III. Screening.

Inspection	Requirement paragraph	Test method paragraph
Stabilization bake 1/	3.5.1	4.7.2
Thermal shock	3.5.1	4.7.2
Burn-in 2/	3.5.1	4.7.2
Run-in	3.5.1	4.7.2
Visual and mechanical inspection	3.5.1	4.7.2

1/ For hermetically sealed switches only.
2/ For logically controlled switches only.

TABLE IV. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection 1/	3.1,3.3,3.4,3.29 and 3.30	4.7.1
Run-in 1/	3.5.2	4.7.3
VSWR	3.5.3	4.7.4
Insertion loss	3.5.4	4.7.5
Isolation	3.5.5	4.7.6
Switching time	3.5.7	4.7.8
Operating current and voltage	3.5.8	4.7.9
Operating force (manually controlled)	3.5.9	4.7.10

1/ Nonscreened switches only.

4.6.2 Periodic inspection. Periodic inspection shall consist of group B inspection. Except where the results of these inspections show noncompliance with the applicable requirements (see 4.6.2.5), delivery of products which have passed the screening and group A inspections (screened items only) or group A inspection (nonscreened items only) shall not be delayed pending the results of these periodic inspections.

4.6.2.1 Group B inspection. Group B inspection shall consist of the inspections, specified in table V, in the order shown. The sample shall be divided into two groups of two units each. The units shall then be subjected only to the inspection indicated for their particular group. Group B inspection shall be made on sample units selected from inspection lots which have passed the group A inspection.

4.6.2.2 Sampling plan. Four sample units (see 4.5.2) shall be selected every 24 months. The first inspection shall be 24 months after the date of notification of qualification.

4.6.2.3 Failures. If one or more sample units fail to pass group B inspection, the sample shall be considered to have failed.

4.6.2.4 Disposition of sample units. Sample units which have been subjected to group B inspection shall not be delivered on contract.

4.6.2.5 Noncompliance. If a sample fails to pass group B inspection, the manufacturer shall notify the qualifying activity and cognizant inspection activity of such failure and take corrective action on the material or processes, or both, as warranted, and on all units of product which can be corrected and which are manufactured under essentially the same conditions, with essentially the same materials and processes, and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the Government, has been taken. After the corrective action has been taken, group B inspection shall be repeated on additional sample units (all inspections, or the inspection which the original sample failed) at the option of the qualifying activity. Group A inspection may be reinstituted; however, final acceptance shall be withheld until the group B inspection has shown that corrective action was successful. In the event of failure after inspection, information concerning the failure and the corrective action taken shall be furnished to the cognizant inspection activity and the qualifying activity.

TABLE V. Group B inspection.

Inspection	Requirement paragraph	Test method paragraph
Group I (2 samples)		
RF power handling capability	3.5.6	4.7.7
Dielectric withstanding voltage	3.6	4.7.11
Transient interference 1/	3.8	4.7.13
RF energy leakage	3.9	4.7.14
Heat (fail-safe switches only)	3.10	4.7.15
Switching time	3.5.7	4.7.8
Solderability 2/	3.11	4.7.16
Resistance to soldering heat 2/	3.12	4.7.17
Switching time	3.5.7	4.7.8
Operating current	3.5.8	4.7.9
Resistance to solvents	3.13	4.7.18
Terminal strength 3/	3.14	4.7.19
Thermal shock	3.15	4.7.20
Insertion loss	3.5.4	4.7.5
Isolation	3.5.5	4.7.6
Switching time	3.5.7	4.7.8
Altitude and cold	3.16	4.7.21
Switching time	3.5.7	4.7.8
Dielectric withstanding voltage	3.6	4.7.11
Moisture resistance 4/	3.17	4.7.22
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Dielectric withstanding voltage	3.6	4.7.11
Humidity 5/	3.18	4.7.23
VSWR	3.5.3	4.7.4
Isolation	3.5.5	4.7.6
Visual and mechanical inspection	3.1,3.3,3.4,3.29, and 3.30	4.7.1
Group II (2 samples)		
Insulation resistance	3.7	4.7.12
Sand and dust 6/	3.19	4.7.24
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Immersion 7/	3.20	4.7.25
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Hermetic seal 8/	3.21	4.7.26

See footnotes at end of table.

TABLE V. Group B inspection - Continued.

Inspection	Requirement paragraph	Test method paragraph
Group II (2 samples) - Continued		
Life cycle	3.22	4.7.27
VSWR	3.5.3	4.7.4
Insertion loss	3.5.4	4.7.5
Isolation	3.5.5	4.7.6
Switching time	3.5.7	4.7.8
Explosion	3.23	4.7.28
Insertion loss	3.5.4	4.7.5
Salt spray 9/	3.24	4.7.29
Switching time	3.5.7	4.7.8
Vibration	3.25	4.7.30
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Acoustic noise 1/	3.26	4.7.31
VSWR	3.5.3	4.7.4
Insertion loss	3.5.4	4.7.5
Shock	3.27	4.7.32
Insertion loss	3.5.4	4.7.5
Switching time	3.5.7	4.7.8
Solar radiation	3.28	4.7.33
Isolation	3.5.5	4.7.6
Switching time	3.5.7	4.7.8
Visual and mechanical inspection	3.1,3.3,3.4,3.29, and 3.30	4.7.1

1/ When specified.
2/ Switches with solderable leads or terminals.
3/ Switches with leads or terminals.
4/ Applicable to types E and I only.
5/ Applicable to types E and O only.
6/ Applicable to type E only.
7/ Applicable to type I only.
8/ Applicable to type H only.
9/ Applicable to types H and I only.

4.6.3 Inspection of packaging. The sampling and inspection of the preservation, packing, and container marking shall be in accordance with the requirements of MIL-S-28786.

4.7 Methods of inspection.

4.7.1 Visual and mechanical inspection. Switches shall examined to verify that the materials, design, construction, physical dimensions, finish, marking, serialization, and workmanship are in accordance with the applicable requirements.

4.7.2 Screening (see 3.5.1). Switches shall be screened as specified in 4.7.2.1 through 4.7.2.5.

4.7.2.1 Stabilization bake. Nonoperating hermetically sealed switches shall be subjected to a stabilization bake temperature of 100°C for a period of 24 hours. Following this test, the switch shall pass the hermetic seal requirement (see 3.21).

4.7.2.2 Thermal shock. With the connections covered, switches shall be tested in accordance with method 107 of MIL-STD-202. The following details and exceptions shall apply:

a. Mounting: Normal mounting.

b. Test condition: B, except the temperature extremes shall be -55°C to +105°C and the number of cycles shall be 10. Place switches in the cold chamber for one-half hour. Switches should be so positioned that they are exposed to freely circulating chamber air. Remove switches from the cold chamber and place in the hot chamber for one-half hour. Transfer shall take place within five minutes of removal from the cold chamber. One cycle consists of room temperature to cold, to room temperature to hot, and back to room temperature.

4.7.2.3 Burn-in. Logically controlled switches shall be placed within a temperature chamber and the dc power supply voltage connected. The maximum dc power supply voltage shall be applied to the switches and the chamber temperature shall be raised so that the measured housing temperature is equal to the specified highest operating temperature. The switches shall remain under these conditions for a period of 160 hours. Electrical measurements before or during burn-in shall be at the discretion of the manufacturer.

4.7.2.4 Run-in. Switches shall be tested as specified in 4.7.3.

4.7.2.5 Visual and mechanical inspection. Visual and mechanical inspection of switches shall be as specified in 4.7.1.

4.7.3 Run-in (see 3.5.2). Using the test setup of figure 1, the switch shall be operated at a rate not to exceed one position per second for 4,800 cycles. One cycle shall consist of switching from the initial position into each other position and returning to the initial position. Switches with externally accessible contacts (such as indicating or interlock circuit contacts) shall have the contact resistance of these contacts measured and recorded both before and after run-in. Any contact resistance measurement greater than 240 milliohms shall be cause for rejecting these switches.

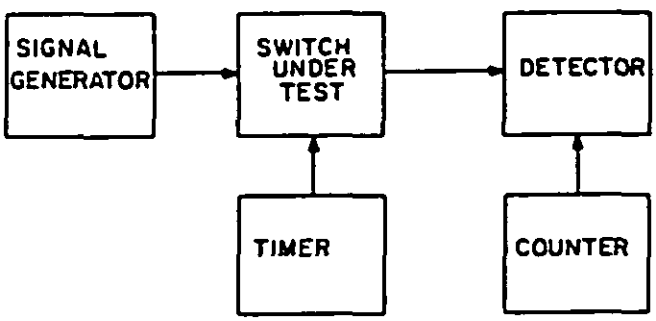


FIGURE 1. Run-in and cycle life test setup.

4.7.4 Voltage standing wave ratio (see 3.5.3). With the switch at room ambient temperature, apply nominal operating voltage and measure the VSWR for each RF path across the specified frequency range, using the test setup of figure 2. Relatively low RF input power shall be used for this test. Each unused port shall be terminated in a matched load. A means shall be provided for producing a permanent record of the switch's VSWR versus frequency. The VSWR shall be recorded in increments of 0.05 between VSWR limits of 1.02:1 and 1.5:1 and 0.1 above 1.5:1. If the test must be made at fixed frequencies, the test shall be made at not less than 7 equally spaced points evenly distributed across the bandwidth of the switch. If VSWR is not directly measured; that is, if return loss is measured and VSWR calculated from that measurement, the permanent record shall indicate the worst case VSWR numerically and shall provide the calculation used to obtain the calculated VSWR. The measurement system and permanent record shall provide a minimum accuracy of .04 over the frequency ranges below 26.5 GHz and a minimum accuracy of .08 over the frequency ranges 26.5 GHz and above.

4.7.5 Insertion loss (see 3.5.4). With the switch at room ambient temperature, apply nominal operating voltage (see 3.1) and measure the insertion loss for each RF path, using the general test procedures and test setup of 4.7.6. The calibration lines on the recorder shall be .02 dB step above and below the specified insertion loss value. The measurement system and permanent record shall provide a minimum accuracy of .04 dB over the frequency ranges below 26.5 GHz and a minimum accuracy of .08 dB over the frequency ranges 26.5 GHz and above.

4.7.6 Isolation (see 3.5.5). Connect the equipment as illustrated on figure 3. The characteristics of the low pass filter shall be such that it will attenuate all harmonics of the RF signal for at least 30 dB. Set the start/stop limits on the sweep oscillator to the specified lowest and highest frequency values, respectively. Connect the calibrated attenuator to the output of the network analyzer. Adjust the horizontal sensitivity of the X-Y recorder for 10 inches of travel and using the sweep oscillator sweep output signal, set the sweep width for the same value. Adjust the RF power level on the sweep oscillator to a level that will provide the best detection efficiency for the detector. With the sweep oscillator adjusted and the network analyzer and X-Y recorder calibrated, draw calibration lines in 1 dB step above and below the specified isolation value of the switch on the X-Y recorder. Remove the calibrated attenuator and insert the switch under test. Terminate all unused ports with matched loads. With the switch at room ambient temperature, apply the nominal operating voltage and record the isolation versus frequency on the recorder. The frequency shall be labeled and recorded at not less than 5 equally spaced points evenly distributed across the frequency band. Repeat the above procedures for any other adjacent ports. If the test must be made at fixed frequencies, the test shall be made at not less than 7 equally spaced points evenly distributed across the bandwidth of the switch. The overall inaccuracy of isolation measurements shall be no greater than 5 percent. A means shall be provided for producing a permanent record of the switch's isolation versus frequency if fixed frequencies or other than the above test setup is used.

4.7.7 RF power handling capability (see 3.5.6). The RF power sources shall be capable of furnishing the specified average and peak power to the input of the switch. The output of the switch shall be terminated in a 50-ohm load. The temperature of the switch shall reach equilibrium (not vary more than ±3°C within a 15 minute period) prior to the initiation of the test. The power source shall be adjusted to the lowest specified frequency and the specified average power. Apply this power to the input of the switch for at least one hour. At the end of this time, remove the average power and apply the specified peak power (at the same frequency) to the input of switch for at least five minutes. Repeat these procedures at the specified middle frequency and at the highest frequency. The above procedures shall be repeated for each position of the switch. If required to switch under power and if the switch design includes interlock circuits used to interrupt the RF power source during switching (see 3.1), the circuits shall be used to do so during this test.

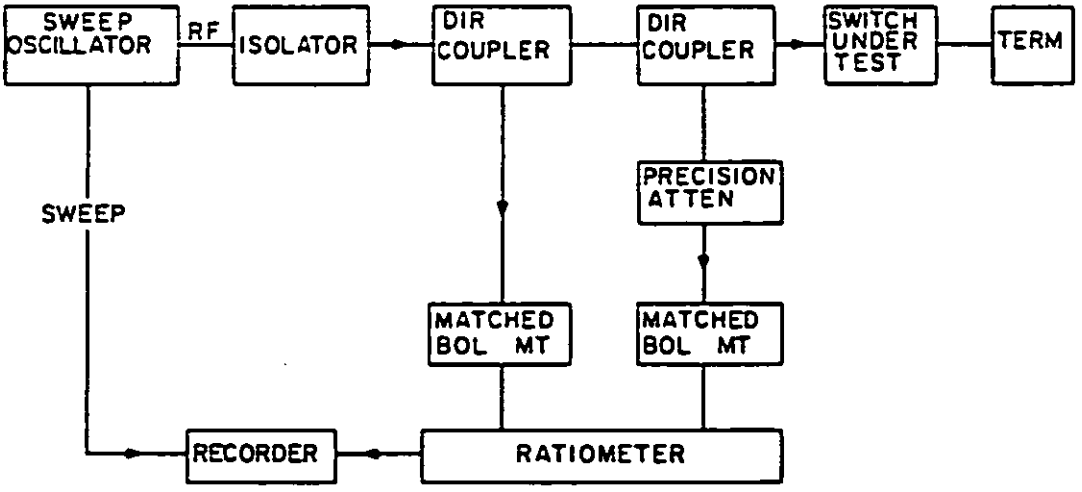


FIGURE 2. Voltage standing wave ratio measurement test setup.

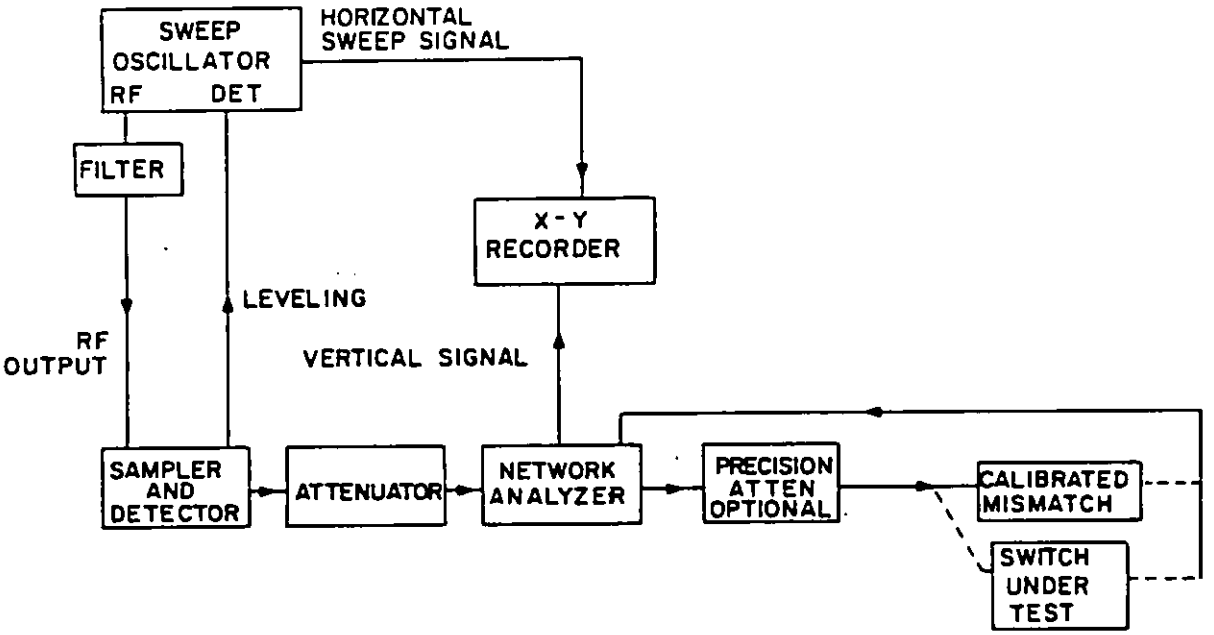


FIGURE 3. Isolation test setup.

4.7.8 Switching time (see 3.5.7). For electrically operated switches, the switching time from both the energized and deenergized positions shall be measured, using the test setup of figure 4. With the switch at room ambient temperature, apply RF and dc power and measure the time lapse between application of dc actuator power and final positioning of the RF portion of the switch for the position selected. Measure the time lapse for the switch to go from an energized position to a deenergized position. Repeat these tests for each electrically selected position of the switch.

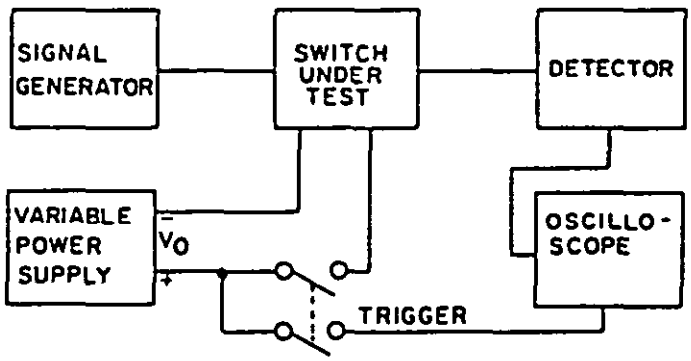


FIGURE 4. Switching time test setup.

4.7.9 Operating current and voltage (see 3.5.8). The operating current and voltage of the switches shall be measured as specified in 4.7.9.1 through 4.7.9.4.

4.7.9.1 Pull-in voltage. With the switch at room ambient temperature, connect a voltmeter directly across the input terminals of the selected position. Slowly increase the actuator voltage and note the actual voltage at which the actual switching action occurs. Repeat this test for each position requiring the application of actuator power. Repeat the above procedure with the switch at the lowest and highest specified operating temperature (see 3.1).

4.7.9.2 Dropout voltage (fail-safe type). With the switch at room ambient temperature, connect a voltmeter across the terminals of the selected switch position and apply nominal operating voltage (see 3.1). Gradually reduce the actuator voltage until the switch returns to the deenergized position. The above test shall be repeated for each switch position requiring actuator power.

4.7.9.3 Operating current. With the switch at room ambient temperature, apply nominal operating voltage (see 3.1) and measure the operating current for each RF position, using the test setup of figure 5. Repeat the above procedure with the switch at the lowest and highest specified operating temperature (see 3.1). Care should be taken during the measurements to insure that the temperature of the switch has stabilized.

4.7.9.4 Holding curent (fail-safe and selective type switches). The holding current for each RF position shall be measured using the same procedures and equipment as 4.7.9.3. The holding current shall be measured at room ambient temperature, at minimum operating temperature and at maximum operating temperature.

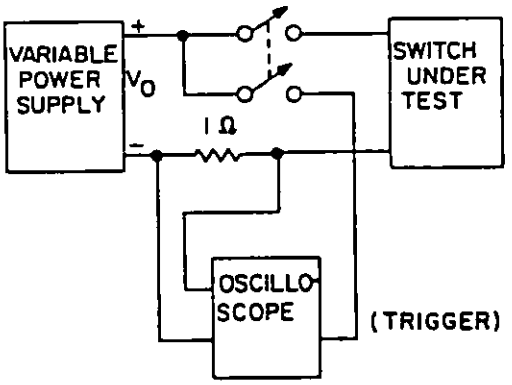


FIGURE 5. Operating and holding current test setup.

4.7.10 Operating force (manually controlled switches, see 3.5.9). No more than a push or pull force of 5 pounds or a torque of 12 pound-inches or 2.5 pound-inches minimum shall be applied to initiate a change in position.

4.7.11 Dielectric withstanding voltage (see 3.6). Switches shall be tested in accordance with method 301 of MIL-STD-202. The following details shall apply:

a. Magnitude of test voltage:

(1) RF connectors: As specified on applicable connector specification.
(2) Actuator and indicator terminals:
DC operated switches: 1,000 V dc.
AC operated switches: 1,000 V dc.

b. Points of application of test voltage:

(1) Indicator and interlock circuit: The test voltage shall be applied in turn between each separate position indicator and interlock circuit terminal and the switch house (ground). All open indicator and interlock circuit terminals shall be grounded to the switch housing (ground) for this test.

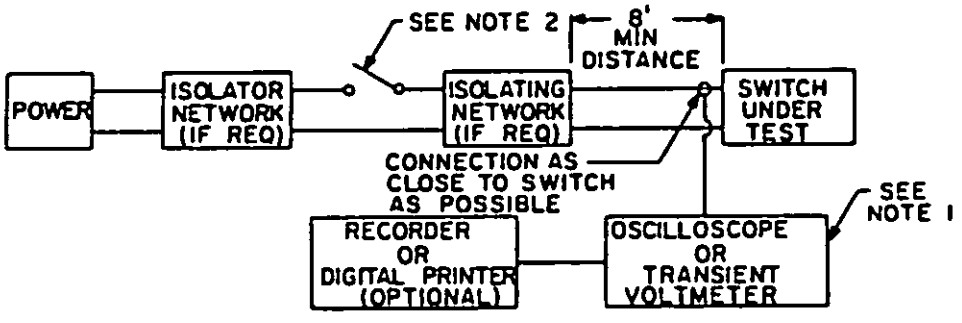
(2) Actuator circuit: The test voltage shall be applied between the actuator terminals and the switch housing (ground). All actuator terminals shall be connected together for this test so that any RFI noise suppression devices are not damaged.

4.7.12 Insulation resistance (RF connectors) (see 3.7). Switches shall be tested in accordance with method 302 of MIL-STD-202. The following details shall apply:

a. Test condition letter: C.

b. Points of measurement: RF connector shall be tested to ground and to each of all other open pins.

4.7.13 Transient interference (RFI) (when specified) (see 3.8). Transient interference emanating from the switch shall be measured on the power lines using the test procedure of figure 6.



NOTES:
1. Oscilloscope or transient voltmeter should be of the memory storage type and be capable of detecting and measuring:

Magnitude:	±1 volt to ±1,000 volts
Width:	50 nanoseconds to 100 milliseconds
Pulse repetition frequency:	single shot to 500 PPS
Input impedance:	100 kΩ minimum

2. Use of a low noise mercury switch is recommended to activate the coaxial switch.
   Procedure:
   a. Activate switch at least 20 times.
   b. Highest reading obtained is to be recorded for both make and break.

FIGURE 6. RFI transient test arrangement and test procedure.

4.7.14 RF energy leakage (see 3.9). Using the test setup shown on figure 7, the input of the switch shall be furnished with a minimum of 10 milliwatts of RF power at the center frequency of the switch pass band. Each output port shall be terminated in a matched load. The entire external surface of the switch shall be explored for maximum RF leakage. This test shall be repeated for each switch position.

4.7.15 Heat (fail-safe switches only) (see 3.10). The switch shall be energized with the proper voltage and current and held in this position. The energized switch shall then be placed in an oven at the maximum rated operating temperature of the switch (see 3.1) and kept at this temperature for 4 hours. At the end of the 4 hours, the switch shall be tested for switching time (see 4.7.8).

4.7.16 Solderability (see 3.11). The terminals of the switch shall be tested in accordance with method 208 of MIL-STD-202.

4.7.17 Resistance to soldering heat (see 3.12). Switches shall be tested in accordance with method 210 of MIL-STD-202. The following details and exceptions shall apply:

a. Special preparation: The terminals shall not have been soldered previously.

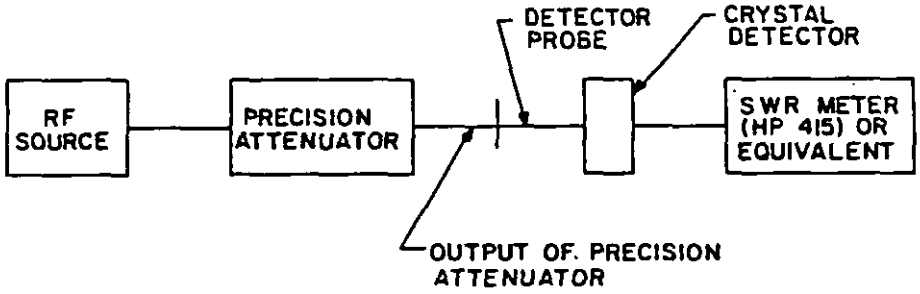
b. Depth of immersion in the molten solder: To point .0625 + .0312, -0 inch from the body.

c. Test condition: A.

d. Cooling time: Stabilize to +25°C.

4.7.18 Resistance to solvents (see 3.13). Switches shall be tested in accordance with method 215 of MIL-STD-202. All portions of the switch shall be bushed. The RF connectors shall be capped.

4.7.19 Terminal strength (see 3.14). Switches shall be tested in accordance with 4.7.19.1, 4.7.19.2, or 4.7.19.3.



Test setup for calibration for RF leakage detector. The calibration sensitivity of the test position shall be 90 dB relative to the power output of the RF source.

FIGURE 7. Test setup for RF leakage.

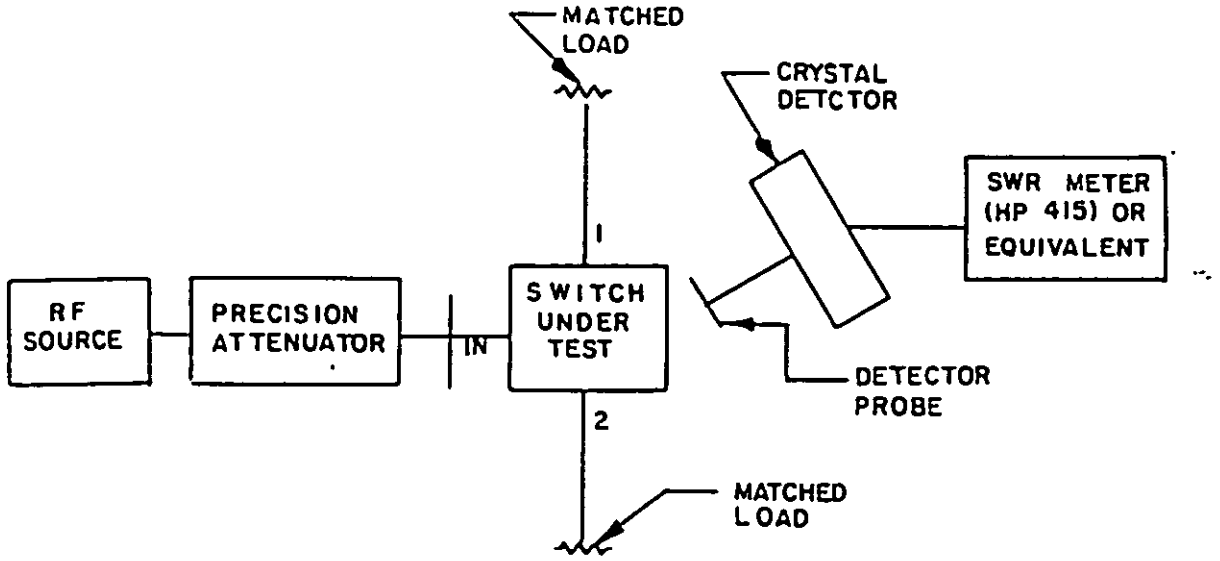


FIGURE 7. Test setup for RF leakage - Continued.

4.7.19.1 Solder terminals. These switches shall be tested in accordance with method 211 of MIL-STD-202. The following details shall apply:

a. Test condition letter: A.

b. The applied force shall be 4.5 pounds.

4.7.19.2 Lead integrity. Switches with leads shall be tested in accordance with method 211 of MIL-STD-202, test condition C. The applied force shall be 8 ±0.5 ounces. For leads with a section modulus equal to or less than that of a lead with a cross section of 0.006 x 0.20, the force shall be 3 ±0.3 ounces.

4.7.19.3 Screw terminals. These switches shall be subjected to the tests specified in 4.7.19.3.1 and 4.7.19.3.2.

4.7.19.3.1 Pull. The terminals shall be subjected to a pull of the applicable static force specified in table VI in a direction along the axis of the terminal screw, in a direction perpendicular to the axis of the terminal screw, and in the direction most likely to cause failure. The force shall be applied for one minute in each of the directions.

TABLE VI. Static values of force.

Thread size	Force in pounds
.112 - 40 UNC - 2A (4-40)	5
.138 - 32 UNC - 2A (6-32)	30
.164 - 32 UNC - 2A (8-32)	35
.190 - 32 UNF - 2A (10-32)	40
.190 - 24 UNC - 2A (10-24)	40
.250 - 28 UNF - 2A (1/4-28)	50

4.7.19.3.2 Torque. Terminals of the switches shall be tested in accordance with method 211 of MIL-STD-202. The following details and exceptions shall apply:

a. Test condition letter: E, except that for thread size .190 - 24 UNC, the torque shall be 24.0 pound-inches.

b. Direction of torque: In the direction which will tighten the screws.

4.7.20 Thermal shock (see 3.15). Switches shall be tested as specified in 4.7.2.2.

4.7.21 Altitude and cold (see 3.16). Switches shall be placed in a pressure chamber maintained at a temperature of -55°C +0°C, -5°C for 24 hours. After temperature stabilization, the switching time shall be measured as specified in 4.7.8. The pressure shall then be changed as quickly as the chamber permits from standard ambient barometric pressure to 1.3 inches of mercury (approximately 70,000 feet elevation) and then stabilized. During the last 4 hours of the 24 hour holding period, the switches shall be tested to determine the dielectric withstanding voltage and switching time (see 4.7.11 and 4.7.8, respectively). For the dielectric withstanding test, only one-half of the voltage specified in 4.7.11 shall be applied. This voltage shall not be applied during the actual switching operation. Remotely control switches shall be operated with the minimum actuator voltage (see 3.5.8).

4.7.22 Moisture resistance (applicable to types E and I only) (see 3.17). Switches shall be tested in accordance with method 106 of MIL-STD-202. Protective connector caps shall be used during test. The following details shall apply:

a. Initial measurements: Not applicable.

b. Polarization voltage: Not applicable.

c. Loading voltage: Not applicable.

d. Final measurements: Unless otherwise specified (see 3.1), the following measurements shall be made within five minutes after removal from humidity:

(1) Insertion loss (see 4.7.5).
(2) Switching time (see 4.7.8).
(3) Dielectric withstanding voltage (see 4.7.11).

4.7.23 Humidity (applicable to types E and O) (see 3.18). Switches shall be tested in accordance with method 103 of MIL-STD-202. The following details shall apply:

a. Measurements after conditioning: Not applicable.

b. Test condition letter: B (protective connector caps shall be used during test).

c. Final measurements: After drying period, voltage standing wave ratio and isolation shall be measured as specified in 4.7.4 and 4.7.6, respectively.

4.7.24 Sand and dust (applicable to type E only) (see 3.19). Closed switches shall be tested in accordance with method 110 of MIL-STD-202 except the duration shall be one-half hour only. The following details shall apply:

a. Test condition letter: A (protective connector caps shall be used during the test).

b. High velocity: Applicable.

4.7.25 Immersion (applicable to type I only) (see 3.20). Immersion-proof switches shall be tested in accordance with method 104 of MIL-STD-202. The following details shall apply:

a. Test condition letter: A (protective connector caps shall be used during test).

b. During test cycle and while submerged, the sample shall be subjected to a low barometric pressure of 3.44 inHg (50,000 feet altitude).

c. Measurements: No leakage as evidenced by a continuous stream of bubbles. Bubbles which are the results of entrapped air on the exterior surface of the switch shall not be considered as indication of leakage. Following this test, the insertion loss and switching time shall be measured as specified in 4.7.5 and 4.7.8, respectively.

4.7.26 Hermetic seal (applicable to type H only) (see 3.21). Hermetically sealed switches shall be tested in accordance with MIL-STD-202, method 112. The following details shall apply:

a. Test condition letter: C (protective connector caps shall be used during test).

b. Procedure: III.

c. Degree of leakage rate sensitivity: See 3.21.

4.7.27 Life cycle (see 3.22). The switch shall be securely mounted on a block weighing not less than five times the weight of the switch; the switch temperature shall be allowed to stabilize at room ambient temperature for not less than one hour before the beginning of the test. Unless specified, RF power need not be applied to the switch. Using the test setup of figure 1, the switch shall be operated at a rate not to exceed one position per second, for the number of cycles specified (see 3.1). One cycle shall consist of switching from the initial position into each other position and returning to the initial position. The operating voltage shall be nominal (+10, -0 percent). When indicator or interlock circuits are included in the design, they shall be energized with the specified current and voltage (see 3.1) during this test. The contact resistance of these circuits shall be measured at the switch connector or terminals before and after this test. Any contact resistance measurement greater than 240 milliohms shall be cause for rejecting the switch.

4.7.28 Explosion (applicable to remotely-controlled types H and I only) (see 3.23). Switches shall be tested in accordance with method 109 of MIL-STD-202. Following the test, insertion loss shall be measured as specified in 4.7.5.

4.7.29 Salt spray (corrosion) (applicable to types H and I only) (see 3.24). Switches shall be tested in accordance with method 101 of MIL-STD-202. The following details shall apply:

a. Salt solution: Five percent solution.

b. Special mounting: Nonferrous materials shall be used to hold the part under test.

c. Test condition letter: B.

d. Following this test, visual inspection shall be made, and the insertion loss and switching time shall be measured as specified in 4.7.5 and 4.7.8, respectively. During the test, the RF connectors should be protected by suitable caps.

4.7.30 Vibration (see 3.25). Switches shall be tested in accordance with method I or method II as specified (see 3.1).

a. Method I. MIL-STD-202, method 204, the following details shall apply:

(1) Mounting: Rigidly mounted.
(2) Electrical load: A suitable indicating device shall be connected across the closed contacts to determine if contacts remain in the proper position.
(3) Test condition letter: C, except that the frequency cycle shall be swept three times in each of three mutually perpendicular directions, one of which shall be parallel to the line of action of the RF switching mechanism (total of approximately three hours).
(4) Resonance: Not applicable.
(5) Measurements: During the test, a suitable indicating device shall be connected across the closed contacts to determine if contacts remain continuously in the proper position (10 microseconds of chatter allowed for response time of chatter monitoring equipment). During the test, the switch shall be actuated and cycled through each position five times. At each position, any sign of intermittent contact shall be noted. Following the test, the insertion loss and switching time shall be measured as specified in 4.7.5 and 4.7.8, respectively.

b. Method II. MIL-STD-202, method 201, the following details shall apply:

(1) Tests and measurements prior to vibration: None.
(2) Method of mounting: Rigidly mounted.
(3) Test and measurements during and after vibration: During the test a suitable indicating device shall be connected across the closed contacts to determine if contacts remain continuously in the proper position (10 microseconds of chatter allowed for response time of chatter monitoring equipment). Following the test, the insertion loss and switching time shall be measured as specified in 4.7.5 and 4.7.8, respectively.

4.7.31 Acoustic noise (when specified) (see 3.26). Switches shall be tested in accordance with method 515 of MIL-STD-810. The following details shall apply:

a. Pretest data: Not required.

b. Test category: As specified (see 3.1).

c. Operation during test: Not required.

d. Following test, voltage standing wave ratio and insertion loss shall be as specified in 4.7.4 and 4.7.5 respectively.

4.7.32 Shock (specified pulse) (see 3.27). Switches shall be tested in accordance with method 213 of MIL-STD-202 as applicable. The following details shall apply:

a. Special mounting: Not applicable.

b. Reference surface: Not applicable.

c. Test condition letter: G.

d. Measurements: Following this test, the insertion loss and switching time shall be measured as specified in 4.7.4 and 4.7.5 respectively.

4.7.33 Solar radiation (sunshine) (see 3.28). Switches shall be tested in accordance with MIL-STD-810, method 505, procedure I, except exposure to solar radiation energy shall be a rate of 360 BTU per square foot per hour.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-S-28786.

6. NOTES

6.1 Intended use. Switches covered by this specification are designed for use with RF coaxial transmission line systems. Uses include antenna switching, receiver or component protection, load divider circuits, and the control of display signals.

6.2 Ordering data. Acquisition document should specify the following:

a. Title, number, and date of this specification.

b. Title, number, and date of applicable specification sheet, class, and complete part number.

c. Specify when aluminum should not be anodized (see 3.3.6).

d. Indicating circuits (see 3.4.12).

e. Sequence, if other than break-before-make (see 3.4.3).

f. If resistance termination is to be other than 50 ohms (see 3.4.4).

g. If continuous duty is required (see 3.4.6).

h. Whether switches shall be required to switch under power (see 3.5.6).

i. Specify if measurements of moisture resistance shall be other than specified (see 4.7.22d).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in applicable qualified products list whether or not such products have actually been so listed by that date. The attention of the contractors is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts for the products covered by this specification. The activity responsible for the qualified products list is the Space and Naval Warfare Systems Command, SPAWAR 003-121, Department of the Navy, Washington, DC 20363-5100; however, information pertaining to qualification of products may be obtained from the Defense Electronics Supply Center (DESC-EQT), Dayton, OH 45444-5288.

6.3.1 Copies of "Provisions Governing Qualification" SD-6 may be obtained upon application to Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

6.4 Definitions. For the purpose of this specification, the following definitions shall apply:

6.4.1 Dropout voltage. The dropout voltage is defined as the minimum operating voltage at which the switch returns to the deenergized position.

6.4.2 Fail-safe switch. A fail-safe switch is defined as a switch with an actuator that contains a spring return mechanism that provides RF connection to one selected position when no dc or ac voltage is applied to the switch. This type of switch requires continuous voltage to maintain RF connection to any other position.

6.4.3 Holding current. The holding current is defined as the current required to hold the switch in position after the RF contacts have completely transferred.

6.4.4 Indicating circuit. An indicating circuit is a circuit that remotely indicates the switch position. This is normally done with indicator lights. The indicating circuit is a set of contacts that is controlled by the same shaft as the RF switch.

6.4.5 Latching switch. A latching switch is defined as a switch that contains a mechanism, either mechanical or magnetic, that will maintain a chosen RF position. This is with or without voltage being maintained after the switching action is completed.

6.4.6 Pull-in voltage. The pull-in voltage is defined as the minimum operating voltage at which the switch contacts assume the energized position.

6.4.7 Rotor motion delay. The rotor motion delay is defined as the time between application of the switching voltage and the beginning of rotor motion.

6.4.8 Switching time. The switching time is defined as beginning when the dc operating voltage is first applied and ending when the switch RF signal reaches its steady-state value. Switching time consists of the following time elements:

a. Inductive delay time in the actuator coil.

b. Transfer time of the RF contacts.

c. Bounce time of the RF contacts.

6.4.9 Transfer switch. A transfer switch is defined as a switch with four ports and provides two independent pairs of RF paths. These pairs are actuated simultaneously.

6.4.10 Operating current. The operating current is that current required for satisfactory operation of the switch. The value of the current is normally specified for operation at room ambient temperature.

6.4.11 Interlock circuits. An interlock circuit is designed into a latching type of switch. The switch will remain in the last position, until the switch is reenergized.

6.5 Occupation Safety and Health Administration (OSHA). OSHA review completed; no further review required.

6.6 Subject term (key word) listing.

Switches, coaxial
Switches, RF

6.7 Change from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

APPENDIX

Group Qualification

10. SCOPE

10.1 Scope. This appendix provides manufacturers a grouping that can be used to obtain qualification for a number of switches by qualifying one switch in a group. The electrical parameters of this one switch shall be equal to or better than the other switches operating over the same frequency range. The grouping shall be in accordance with table VII. Manufacturers may qualify switches at a lower frequency range than listed under column A of the table. This will qualify switches with the stated characteristics under column B from this frequency range down to the lowest frequency range specified. Manufacturers may also qualify multi-throw switches with a lower number of throws than listed under column A of the table. This will qualify switches with the stated characteristics under column B from this multi-throw number down to the lowest number specified. Manufacturers may qualify switches at a higher energizing voltage than listed under column A of the table. This will qualify switches with the stated characteristics under column B from this voltage level to the highest voltage level specified. This appendix is a mandatory part of the specification. The information contained herein is intended for compliance.

20. APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

TABLE VII. Grouping for qualification.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
1	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
2	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
3	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
4	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
5	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Manual	Manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	RF power level - Standard	RF power level - Standard
	Seal - Enclosed	Seal - Enclosed and open
6	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Manual	Manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	RF power level - Standard	RF power level - Standard
	Seal - Enclosed	Seal - Enclosed and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
7	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
8	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
9	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
10	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
11	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
12	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
13	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
14	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
15	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Manual	Manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	RF power level - Standard	RF power level - Standard
	Seal - Enclosed	Seal - Enclosed and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
16	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Manual	Manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	RF power level - Standard	RF power level - Standard
	Seal - Enclosed	Seal - Enclosed and open
17	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
18	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
19	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed and open
20	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
21	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
22	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
23	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
24	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
25	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
26	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
27	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
28	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
29	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
30	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
31	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
32	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
33	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
34	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
35	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
36	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
37	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote.- Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
38	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
39	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
40	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
41	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
42	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
43	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
44	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
45	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
46	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
47	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
48	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
49	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
50	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
51	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
52	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
53	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
54	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
55	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
56	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
57	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
58	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
59	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
60	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
61	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
62	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
63	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
64	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
65	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
66	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
67	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
68	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
69	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
70	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
71	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
72	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
73	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
74	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
75	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
76	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
77	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
78	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
79	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
80	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
81	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
82	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
83	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
84	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
85	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
86	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
87	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
88	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
89	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
90	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
91	Transfer (2P2T) Frequency range DC-40 GHz Remote - Latching with logic control Without indicator Screened Energizing voltage - 12 V dc plus logic signal RF power level - Standard Seal - Immersion	Transfer (2P2T) Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4 Remote - Latching with logic control Without indicator Screened and nonscreened Energizing voltage - 12 V dc, 28 V dc, 48 V dc and 110 V dc plus logic signal RF power level - Standard Seal - Immersion, enclosed, and open
92	Transfer (2P2T) Frequency range DC-40 GHz Remote - Latching with logic control Without indicator Nonscreened Energizing voltage - 12 V dc plus logic signal RF power level - Standard Seal - Immersion	Transfer (2P2T) Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4 Remote - Latching with logic control Without indicator Nonscreened Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal RF power level - Standard Seal - Immersion, enclosed, and open
93	Transfer (2P2T) Frequency range DC-40 GHz Remote - Fail-safe With indicator Screened Energizing voltage - 115 V ac RF power level - Standard Seal - Immersion	Transfer (2P2T) Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4 Remote - Fail-safe, latching and manual With and without indicator Screened and nonscreened Energizing voltage - 115 V ac RF power level - Standard Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
94	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
95	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
96	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
97	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
98	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
99	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
100	Transfer (2P2T)	Transfer (2P2T)
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
101	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
102	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
103	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
104	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
105	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Manual	Manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	RF power level - Standard	RF power level - Standard
	Seal - Enclosed	Seal - Enclosed and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
106	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Manual	Manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	RF power level - Standard	RF power level - Standard
	Seal - Enclosed	Seal - Enclosed and open
107	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
108	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
109	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
110	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
111	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; Manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
112	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
113	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
114	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
115	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Manual	Manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	RF power level - Standard	RF power level - Standard
	Seal - Enclosed	Seal - Enclosed and open
116	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Manual	Manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	RF power level - Standard	RF power level - Standard
	Seal - Enclosed	Seal - Enclosed and open
117	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
118	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
119	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
120	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
121	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
122	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
123	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
124	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
125	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
126	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
127	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
128	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
129	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
130	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
131	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
132	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
133	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
134	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
135	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
136	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
137	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe latching, and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
138	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
139	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
140	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
141	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
142	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
143	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
144	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
145	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
146	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
147	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
148	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
149	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
150	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
151	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
152	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Hermetic	Seal - Hermetic, immersion, enclosed, and open
153	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
154	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
155	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
156	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc, and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
157	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
158	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe, latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
159	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
160	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
161	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
162	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
163	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
164	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
165	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
166	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
167	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
168	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
169	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
170	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
171	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
172	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
173	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
174	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
175	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
176	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - High	RF power level - High and standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
177	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, Latching, and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
178	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
179	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
180	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
181	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
182	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
183	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
184	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
185	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
186	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe and latching; manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
187	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
188	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc, and 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
189	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe with logic control	Remote - Fail-safe and latching with logic control
190	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
191	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching with logic control	Remote - Latching with logic control
192	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 12 V dc plus logic signal	Energizing voltage - 12 V dc, 28 V dc, 48 V dc, and 110 V dc plus logic signal
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
193	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
194	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
195	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
196	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	With indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
197	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	Without indicator	With and without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
198	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Fail-safe	Remote - Fail-safe, latching, and manual
	Without indicator	With and without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

TABLE VII. Grouping for qualification - Continued.

Group number	Characteristics of qualifying switch (A)	Characteristics of switches qualified (B)
199	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Screened	Screened and nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open
200	1P10T	1P10T through 1P1T
	Frequency range DC-40 GHz	Frequency range (GHz) DC-40, DC-26.5, DC-20, DC-18.5, DC-12.4, DC-10, DC-6, and DC-.4
	Remote - Latching	Remote - Latching and manual
	Without indicator	Without indicator
	Nonscreened	Nonscreened
	Energizing voltage - 115 V ac	Energizing voltage - 115 V ac
	RF power level - Standard	RF power level - Standard
	Seal - Immersion	Seal - Immersion, enclosed, and open

CONCLUDING MATERIAL

Custodians:
Army - ER
Navy - EC
Air Force - 85

Review activities:
Army - MI
Navy - OS
Air Force - 11, 99
DLA - ES

User activities:
Army - AV
Navy - AS, MC
Air Force - 19

Preparing activity:
Navy - EC

Agent:
DLA - ES

(Project 5985-1016)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-S-39280	SWITCHES, RADIO FREQUENCY TRANSMISSION LINE (COAXIAL), GENERAL SPECIFICATION FOR

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
	☐ USER
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ MANUFACTURER
	☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)